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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/089,578	08/12/2002	Johannes Borsboom	VER-157XX	2516
207	7590	01/23/2004	EXAMINER	
WEINGARTEN, SCHURGIN, GAGNEBIN & LEOVICI LLP TEN POST OFFICE SQUARE BOSTON, MA 02109			LANGEL, WAYNE A	
			ART UNIT	PAPER NUMBER
			1754	

DATE MAILED: 01/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

089578

Applicant(s)

Borsboom et al

Examiner

Langel

Group Art Unit

1754

— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

☒ Responsive to communication(s) filed on 12-19-03

☒ This action is **FINAL**.

- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

☒ Claim(s) 1-34 is/are pending in the application.

Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1-34 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).

☐ All ☐ Some\* ☐ None of the:

☐ Certified copies of the priority documents have been received.

☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_

☐ Copies of the certified copies of the priority documents have been received

in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_

☐ Interview Summary, PTO-413

☐ Notice of Reference(s) Cited, PTO-892

☐ Notice of Informal Patent Application, PTO-152

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Other \_\_\_\_\_

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The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-34 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Groenendaal et al. in view of Kohl et al., for the reasons given in the last Office action. Applicant's argument, that an advantage of the invention is that sulfur dioxide can be selectively removed from the gas mixture by hydrogenation of the sulfur dioxide without substantial reduction of other sulfur components such as elemental sulfur in the gas mixture to hydrogen sulfide, is not convincing, since applicant's claims do not require that sulfur components other than sulfur dioxide be present in the gas mixture. Accordingly, such advantage would not necessarily result from the process recited in applicant's claims. Applicant's argument, that the process of Groenendaal et al. involves the reduction of all sulfur dioxide and other reducible sulfur compounds from a Claus off-gas, is not convincing, since there is no evidence on record showing that the process recited in applicant's claims would not also reduce all

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sulfur dioxide and other reducible sulfur compounds. Applicant's argument, that Groenendaal et al. is silent about the hydrogen content in the gas passed over the reduction catalyst and, in particular, does not suggest any suitable ratio of reducing agent to sulfur dioxide in that gas, is not convincing, since Groenendaal et al. teach at column 3, lines 49 and 50 that an excess of hydrogen-containing gas is preferably present. It would be within the skill of one of ordinary skill in the art to determine how much hydrogen excess should be present, and it would be prima facie obvious to employ a molar ratio of such hydrogen to sulfur dioxide of more than 10 up to 100. There is no evidence on record of unexpected results which would emanate from employing such molar ratio of hydrogen to sulfur dioxide. Applicant's argument, that Groenendaal et al. fail to teach or suggest carrying out the hydrogenation at a ratio of reducing agent to sulfur dioxide in the range of 10 to 100, is not convincing, since Groenendaal et al. teach at column 3, lines 45-49 that the hydrogen-containing gas must be introduced into the process in a quantity which is sufficiently large to reduce to hydrogen sulfide all the sulfur dioxide and other reducible sulfur compounds in the Claus off-gases. Since applicant's claims recite a molar ratio of reducing component to sulfur dioxide of more than 10 up to 100, the ratio of reducing component to sulfur dioxide and other reducible sulfur compounds

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in the Claus off-gases would be at a ratio of less than 10 up to 100, and would not exclude a relatively small excess of about 1%, as applicant argues would be present in the process of Groenendaal et al. (See the paragraph bridging pages 11 and 12 of applicant's remarks filed December 1, 2003.) Applicant's argument, that given the substantial amounts of other sulfur compounds such as elemental sulfur, the off-gas of Groenendaal et al. will contain a high amount of hydrogen sulfide, compared to the gas mixture in the present invention, after it has passed over the hydrogenation catalyst, is not convincing, since the off-gas in the process recited in applicant's claims would not necessarily contain a lower amount of hydrogen sulfide than the off-gas in the process of Groenendaal et al. Applicant's argument, that one of ordinary skill in the art would not consider replacing the oxidation in a solution by a dry bed oxidation, is not convincing, since Groenendaal et al. teach at column 5, lines 31-36 that the treated off-gases from the catalytic reduction are contacted with an adsorbent or absorbent for the removal of hydrogen sulfide, and that any conventional agents which chemically or physically bind the hydrogen sulfide can be used for this purpose, which agents include solid agents. Applicant's argument, that one of ordinary skill in the art would expect that a dry bed would pose a risk of having an excessive temperature rise due to the presence of high amounts of hydrogen

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sulfide after the reduction step in the process of Groenendaal et al. and the reduced heat capacity of a dry bed in comparison to the solution, is not convincing, since applicant's claims do not require any minimum amount of hydrogen sulfide in the gas mixture after the reduction step, which gas mixture has passed through the dry oxidation bed. Accordingly such problem would occur in the process recited in applicant's claims to no less extent than it would in the process of Groenendaal et al., as modified by Kohl et al. Applicant's argument, that Kohl et al. describe a discontinuous dry oxidation process, whereas the process recited in applicant's claims is typically carried out continuously, is not convincing, since applicant's claims do not require that the process be carried out continuously. In any event, it is within the skill of one of ordinary skill in the art to convert a batch or discontinuous process to a continuous process, in the absence of unexpected results.

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED

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STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne A. Langel whose telephone number is (571) 272-1353. The examiner can normally be reached on Monday through Friday from 8 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (571) 272-1358. The fax phone number for this Group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (571) 272-0994.

WAL:cdc

January 21, 2004

WAYNE A. LANGEL  
PRIMARY EXAMINER